



SEQUENCE LISTING

<110> Haruo HANAWA

<120> VECTOR FOR GENE THERAPY AND METHOD OF QUANTIFYING TARGET
PROTEIN IN MAMMAL OR CULTURED CELLS WITH THE ADMINISTRATION
OF THE VECTOR FOR GENE THERAPY

<130> 0760-0347PUS1

<140> US 10/541,626

<141> 2005-07-07

<150> PCT/JP2003/016956

<151> 2003-12-26

<150> JP 2003-3967

<151> 2003-01-10

<160> 24

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<213> Artificial Sequence

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<223> oligopeptide C19-29 region of glucagon of human, mouse or rat

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<223> DNA insert encoding rat IFN-r receptor, rat IgG Fc region
and glucagon C19-29 region

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<223> DNA insert encoding rat IFN-r receptor, rat IgG Fc region
and glucagon C19-29 region

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Pro	Ala	Pro	Thr	Asn	Val	Leu	Ile	Thr	Ser	Tyr	Asp	Leu	Asn	Pro	Val	
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Gln	Val	Lys	Met	Tyr	Pro	Glu	Tyr	Trp	Thr	Asp	Ala	Cys	Thr	Asn	Ile	
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Cys	Ser	Glu	Thr	Leu	Cys	Glu	Leu	Asn	Ile	Ser	Val	Ser	Thr	Leu	Asn	
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95 100 105	
atc gaa gta gcc cag ttt ata tca aaa ctg ctc aat tac tcc aag caa	387

Ile Glu Val Ala Gln Phe Ile Ser Lys Leu Leu Asn Tyr Ser Lys Gln 110 115 120 125	
ctt ttc cgc tat ggc cac gcg gcc gcc gtg ccc aga aac tgt gga ggt Leu Phe Arg Tyr Gly His Ala Ala Ala Val Pro Arg Asn Cys Gly Gly 130 135 140	435
gat tgc aag cct tgt ata tgt aca ggc tca gaa gta tca tct gtc ttc Asp Cys Lys Pro Cys Ile Cys Thr Gly Ser Glu Val Ser Ser Val Phe 145 150 155	483
atc ttc ccc cca aag ccc aaa gat gtg ctc acc atc act ctg act cct Ile Phe Pro Pro Lys Pro Lys Asp Val Leu Thr Ile Thr Leu Thr Pro 160 165 170	531
aag gtc acg tgt gtt gtg gta gac att agc cag gac gat ccc gag gtc Lys Val Thr Cys Val Val Val Asp Ile Ser Gln Asp Asp Pro Glu Val 175 180 185	579
cat ttc agc tgg ttt gta gat gac gtg gaa gtc cac aca gct cag act His Phe Ser Trp Phe Val Asp Asp Val Glu Val His Thr Ala Gln Thr 190 195 200 205	627
cga cca cca gag gag cag ttc aac agc act ttc cgc tca gtc agt gaa Arg Pro Pro Glu Glu Gln Phe Asn Ser Thr Phe Arg Ser Val Ser Glu 210 215 220	675
ctc ccc atc ctg cac cag gac tgg ctc aat ggc agg acg ttc aga tgc Leu Pro Ile Leu His Gln Asp Trp Leu Asn Gly Arg Thr Phe Arg Cys 225 230 235	723
aag gtc acc agt gca gct ttc cca tcc ccc atc gag aaa acc atc tcc Lys Val Thr Ser Ala Ala Phe Pro Ser Pro Ile Glu Lys Thr Ile Ser 240 245 250	771
aaa ccc gaa ggc aga aca caa gtt ccg cat gta tac acc atg tca cct Lys Pro Glu Gly Arg Thr Gln Val Pro His Val Tyr Thr Met Ser Pro 255 260 265	819
acc aag gaa gag atg acc cag aat gaa gtc agt atc acc tgc atg gta Thr Lys Glu Glu Met Thr Gln Asn Glu Val Ser Ile Thr Cys Met Val 270 275 280 285	867
aaa ggc ttc tat ccc cca gac att tat gtg gag tgg cag atg aac ggg Lys Gly Phe Tyr Pro Pro Asp Ile Tyr Val Glu Trp Gln Met Asn Gly 290 295 300	915
cag cca cag gaa aac tac aag aac act cca cct acg atg gac aca gat Gln Pro Gln Glu Asn Tyr Lys Asn Thr Pro Pro Thr Met Asp Thr Asp 305 310 315	963
ggg agt tac ttc ctc tac agc aag ctc aat gtg aag aag gaa aaa tgg Gly Ser Tyr Phe Leu Tyr Ser Lys Leu Asn Val Lys Lys Glu Lys Trp 320 325 330	1011
cag cag gga aac acg ttc acg tgt tct gtg ctg cat gaa ggc ctg cac Gln Gln Gly Asn Thr Phe Thr Cys Ser Val Leu His Glu Gly Leu His	1059

335 340 345

aac cac cat act gag aag agt ctc tcc cac tct ccg ggt aaa gcc caa 1107
 Asn His His Thr Glu Lys Ser Leu Ser His Ser Pro Gly Lys Ala Gln
 350 355 360 365

gat ttt gtg cag tgg ttg atg aat acc tgagaattc 1143
 Asp Phe Val Gln Trp Leu Met Asn Thr
 370

<210> 6
 <211> 825
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DNA insert encoding rat signal peptide, rat IgG Fc region and
 glucagon C19-29 region

<220>
 <221> CDS
 <222> (13)..(816)
 <223> DNA insert encoding rat signal peptide, rat IgG Fc region and
 glucagon C19-29 region

<400> 6
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 Met Lys Ser Cys Gly Leu Phe Pro Leu Met Val Leu Leu
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gct ctg ggt gta ctg gca ccc tgg agt gtg gaa gga gcg gcc gcc gtg 99
 Ala Leu Gly Val Leu Ala Pro Trp Ser Val Glu Gly Ala Ala Ala Val
 15 20 25

ccc aga aac tgt gga ggt gat tgc aag cct tgt ata tgt aca ggc tca 147
 Pro Arg Asn Cys Gly Gly Asp Cys Lys Pro Cys Ile Cys Thr Gly Ser
 30 35 40 45

gaa gta tca tct gtc ttc atc ttc ccc cca aag ccc aaa gat gtg ctc 195
 Glu Val Ser Ser Val Phe Ile Phe Pro Pro Lys Pro Lys Asp Val Leu
 50 55 60

acc atc act ctg act cct aag gtc acg tgt gtt gtg gta gac att agc 243
 Thr Ile Thr Leu Thr Pro Lys Val Thr Cys Val Val Val Asp Ile Ser
 65 70 75

cag gac gat ccc gag gtc cat ttc agc tgg ttt gta gat gac gtg gaa 291
 Gln Asp Asp Pro Glu Val His Phe Ser Trp Phe Val Asp Asp Val Glu
 80 85 90

gtc cac aca gct cag act cga cca cca gag gag cag ttc aac agc act 339
 Val His Thr Ala Gln Thr Arg Pro Pro Glu Glu Gln Phe Asn Ser Thr
 95 100 105

ttc cgc tca gtc agt gaa ctc ccc atc ctg cac cag gac tgg ctc aat 387
 Phe Arg Ser Val Ser Glu Leu Pro Ile Leu His Gln Asp Trp Leu Asn
 110 115 120 125

ggc agg acg ttc aga tgc aag gtc acc agt gca gct ttc cca tcc ccc	435
Gly Arg Thr Phe Arg Cys Lys Val Thr Ser Ala Ala Phe Pro Ser Pro	
130 135 140	
atc gag aaa acc atc tcc aaa ccc gaa ggc aga aca caa gtt ccg cat	483
Ile Glu Lys Thr Ile Ser Lys Pro Glu Gly Arg Thr Gln Val Pro His	
145 150 155	
gta tac acc atg tca cct acc aag gaa gag atg acc cag aat gaa gtc	531
Val Tyr Thr Met Ser Pro Thr Lys Glu Glu Met Thr Gln Asn Glu Val	
160 165 170	
agt atc acc tgc atg gta aaa ggc ttc tat ccc cca gac att tat gtg	579
Ser Ile Thr Cys Met Val Lys Gly Phe Tyr Pro Pro Asp Ile Tyr Val	
175 180 185	
gag tgg cag atg aac ggg cag cca cag gaa aac tac aag aac act cca	627
Glu Trp Gln Met Asn Gly Gln Pro Gln Glu Asn Tyr Lys Asn Thr Pro	
190 195 200 205	
cct acg atg gac aca gat ggg agt tac ttc ctc tac agc aag ctc aat	675
Pro Thr Met Asp Thr Asp Gly Ser Tyr Phe Leu Tyr Ser Lys Leu Asn	
210 215 220	
gtg aag aag gaa aaa tgg cag cag gga aac acg ttc acg tgt tct gtg	723
Val Lys Lys Glu Lys Trp Gln Gln Gly Asn Thr Phe Thr Cys Ser Val	
225 230 235	
ctg cat gaa ggc ctg cac aac cac cat act gag aag agt ctc tcc cac	771
Leu His Glu Gly Leu His Asn His His Thr Glu Lys Ser Leu Ser His	
240 245 250	
tct ccg ggt aaa gcc caa gat ttt gtg cag tgg ttg atg aat acc	816
Ser Pro Gly Lys Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr	
255 260 265	
tgagaattc	825
<210> 7	
<211> 1284	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> DNA insert encoding rat IL1 receptor antagonist, rat IgG	
Fc region and glucagons C19-29 region	
<220>	
<221> CDS	
<222> (13)..(1275)	
<223> DNA insert encoding rat IL1 receptor antagonist, rat IgG	
Fc region and glucagons C19-29 region	
<400> 7	
gaattcattt aa atg gaa atc tgc tgg gga ccc tac agt cac cta atc tct	51

Met	Glu	Ile	Cys	Trp	Gly	Pro	Tyr	Ser	His	Leu	Ile	Ser				
1				5					10							
ctc	ctt	ctc	atc	ctt	ctg	ttt	cat	tca	gag	gca	gcc	tgc	cgc	cct	tct	99
Leu	Leu	Leu	Ile	Leu	Leu	Phe	His	Ser	Glu	Ala	Ala	Cys	Arg	Pro	Ser	
15						20					25					
ggg	aaa	aga	ccc	tgc	aag	atg	caa	gcc	ttc	aga	atc	tgg	gat	act	aac	147
Gly	Lys	Arg	Pro	Cys	Lys	Met	Gln	Ala	Phe	Arg	Ile	Trp	Asp	Thr	Asn	
30					35				40						45	
cag	aag	acc	ttt	tac	ctg	aga	aac	aac	cag	ctc	att	gct	ggg	tac	tta	195
Gln	Lys	Thr	Phe	Tyr	Leu	Arg	Asn	Asn	Gln	Leu	Ile	Ala	Gly	Tyr	Leu	
				50					55					60		
caa	gga	cca	aat	atc	aaa	cta	gaa	gaa	aag	ata	gac	atg	gtg	cct	att	243
Gln	Gly	Pro	Asn	Ile	Lys	Leu	Glu	Glu	Lys	Ile	Asp	Met	Val	Pro	Ile	
			65					70					75			
gac	ctt	cat	agt	gtg	ttc	ttg	ggc	atc	cac	ggg	ggc	aag	ctg	tgc	ctg	291
Asp	Leu	His	Ser	Val	Phe	Leu	Gly	Ile	His	Gly	Gly	Lys	Leu	Cys	Leu	
		80					85					90				
tct	tgt	gcc	aag	tct	gga	gat	gat	atc	aag	ctc	cag	ctg	gag	gaa	gtt	339
Ser	Cys	Ala	Lys	Ser	Gly	Asp	Asp	Ile	Lys	Leu	Gln	Leu	Glu	Glu	Val	
95						100					105					
aac	atc	act	gat	ctg	agc	aag	aac	aaa	gaa	gaa	gac	aag	cgc	ttt	acc	387
Asn	Ile	Thr	Asp	Leu	Ser	Lys	Asn	Lys	Glu	Glu	Asp	Lys	Arg	Phe	Thr	
110					115					120					125	
ttc	atc	cgc	tct	gag	aaa	ggc	ccc	acc	acc	agc	ttt	gag	tca	gct	gcc	435
Phe	Ile	Arg	Ser	Glu	Lys	Gly	Pro	Thr	Thr	Ser	Phe	Glu	Ser	Ala	Ala	
				130					135					140		
tgt	cca	gga	tgg	ttc	ctc	tgc	aca	aca	cta	gag	gct	gac	cgt	cct	gtg	483
Cys	Pro	Gly	Trp	Phe	Leu	Cys	Thr	Thr	Leu	Glu	Ala	Asp	Arg	Pro	Val	
			145					150					155			
agc	ctc	acc	aac	aca	ccg	gaa	gag	ccc	ctt	ata	gtc	acg	aag	ttc	tac	531
Ser	Leu	Thr	Asn	Thr	Pro	Glu	Glu	Pro	Leu	Ile	Val	Thr	Lys	Phe	Tyr	
		160					165					170				
ttc	cag	gaa	gac	caa	gcg	gcc	gcc	gtg	ccc	aga	aac	tgt	gga	ggt	gat	579
Phe	Gln	Glu	Asp	Gln	Ala	Ala	Ala	Val	Pro	Arg	Asn	Cys	Gly	Gly	Asp	
	175				180						185					
tgc	aag	cct	tgt	ata	tgt	aca	ggc	tca	gaa	gta	tca	tct	gtc	ttc	atc	627
Cys	Lys	Pro	Cys	Ile	Cys	Thr	Gly	Ser	Glu	Val	Ser	Ser	Val	Phe	Ile	
190					195					200					205	
ttc	ccc	cca	aag	ccc	aaa	gat	gtg	ctc	acc	atc	act	ctg	act	cct	aag	675
Phe	Pro	Pro	Lys	Pro	Lys	Asp	Val	Leu	Thr	Ile	Thr	Leu	Thr	Pro	Lys	
				210					215					220		
gtc	acg	tgt	gtt	gtg	gta	gac	att	agc	cag	gac	gat	ccc	gag	gtc	cat	723
Val	Thr	Cys	Val	Val	Val	Asp	Ile	Ser	Gln	Asp	Asp	Pro	Glu	Val	His	

225	230	235	
ttc agc tgg ttt gta gat gac gtg gaa gtc cac aca gct cag act cga Phe Ser Trp Phe Val Asp Asp Val Glu Val His Thr Ala Gln Thr Arg 240 245 250			771
cca cca gag gag cag ttc aac agc act ttc cgc tca gtc agt gaa ctc Pro Pro Glu Glu Gln Phe Asn Ser Thr Phe Arg Ser Val Ser Glu Leu 255 260 265			819
ccc atc ctg cac cag gac tgg ctc aat ggc agg acg ttc aga tgc aag Pro Ile Leu His Gln Asp Trp Leu Asn Gly Arg Thr Phe Arg Cys Lys 270 275 280 285			867
gtc acc agt gca gct ttc cca tcc ccc atc gag aaa acc atc tcc aaa Val Thr Ser Ala Ala Phe Pro Ser Pro Ile Glu Lys Thr Ile Ser Lys 290 295 300			915
ccc gaa ggc aga aca caa gtt ccg cat gta tac acc atg tca cct acc Pro Glu Gly Arg Thr Gln Val Pro His Val Tyr Thr Met Ser Pro Thr 305 310 315			963
aag gaa gag atg acc cag aat gaa gtc agt atc acc tgc atg gta aaa Lys Glu Glu Met Thr Gln Asn Glu Val Ser Ile Thr Cys Met Val Lys 320 325 330			1011
ggc ttc tat ccc cca gac att tat gtg gag tgg cag atg aac ggg cag Gly Phe Tyr Pro Pro Asp Ile Tyr Val Glu Trp Gln Met Asn Gly Gln 335 340 345			1059
cca cag gaa aac tac aag aac act cca cct acg atg gac aca gat ggg Pro Gln Glu Asn Tyr Lys Asn Thr Pro Pro Thr Met Asp Thr Asp Gly 350 355 360 365			1107
agt tac ttc ctc tac agc aag ctc aat gtg aag aag gaa aaa tgg cag Ser Tyr Phe Leu Tyr Ser Lys Leu Asn Val Lys Lys Glu Lys Trp Gln 370 375 380			1155
cag gga aac acg ttc acg tgt tct gtg ctg cat gaa ggc ctg cac aac Gln Gly Asn Thr Phe Thr Cys Ser Val Leu His Glu Gly Leu His Asn 385 390 395			1203
cac cat act gag aag agt ctc tcc cac tct ccg ggt aaa gcc caa gat His His Thr Glu Lys Ser Leu Ser His Ser Pro Gly Lys Ala Gln Asp 400 405 410			1251
ttt gtg cag tgg ttg atg aat acc tgagaattc Phe Val Gln Trp Leu Met Asn Thr 415 420			1284

<210> 8
 <211> 369
 <212> DNA
 <213> Artificial Sequence

<220>

<223> DNA insert encoding human IL8 and glucagon C19-29 region

<220>

<221> CDS

<222> (13)..(360)

<223> DNA insert encoding human IL8 and glucagon C19-29 region

<400> 8

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gaattcattt aa atg act tcc aag ctg gcc gtg gct ctc ttg gca gcc ttc      51
           Met Thr Ser Lys Leu Ala Val Ala Leu Leu Ala Ala Phe
                1                5                10
```

```
ctg att tct gca gct ctg tgt gaa ggt gca gtt ttg cca agg agt gct      99
Leu Ile Ser Ala Ala Leu Cys Glu Gly Ala Val Leu Pro Arg Ser Ala
    15                20                25
```

```
aaa gaa ctt aga tgt cag tgc ata aag aca tac tcc aaa cct ttc cac      147
Lys Glu Leu Arg Cys Gln Cys Ile Lys Thr Tyr Ser Lys Pro Phe His
    30                35                40                45
```

```
ccc aaa ttt atc aaa gaa ctg aga gtg att gag agt gga cca cac tgc      195
Pro Lys Phe Ile Lys Glu Leu Arg Val Ile Glu Ser Gly Pro His Cys
                50                55                60
```

```
gcc aac aca gaa att att gta aag ctt tct gat gga aga gag ctc tgt      243
Ala Asn Thr Glu Ile Ile Val Lys Leu Ser Asp Gly Arg Glu Leu Cys
    65                70                75
```

```
ctg gac ccc aag gaa aac tgg gtg cag agg gtt gtg gag aag ttt ttg      291
Leu Asp Pro Lys Glu Asn Trp Val Gln Arg Val Val Glu Lys Phe Leu
    80                85                90
```

```
aag agg gct gag aat tca gcg gcc gcc ccg ggt aaa gcc caa gat ttt      339
Lys Arg Ala Glu Asn Ser Ala Ala Ala Pro Gly Lys Ala Gln Asp Phe
    95                100                105
```

```
gtg cag tgg ttg atg aat acc tgagaattc      369
Val Gln Trp Leu Met Asn Thr
    110                115
```

<210> 9

<211> 45

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer used for constructing a
vector pCAGGS-IgG-glul9-29

<400> 9

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gagaattcat ttaaattgaga gcggccgccg tgcccagaaa ctgtg      45
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<210> 10

<211> 49

<212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer used for constructing a
 vector pCAGGS-IgG-glul9-29

 <400> 10
 tcaaccactg cacaaaatct tgggctttac ccggagagtg ggagagact 49

 <210> 11
 <211> 45
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer used for constructing a
 vector pCAGGS-IgG-glul9-29

 <400> 11
 gagaattcat ttaaagaga gcggccgccg tgcccagaaa ctgtg 45

 <210> 12
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer used for constructing a
 vector pCAGGS-IgG-glul9-29

 <400> 12
 gagagagaga attctcaggt attcatcaac cactgcacaa aatcttgggc 50

 <210> 13
 <211> 38
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer used for constructing a vector
 pCAGGS-IFN-rR-IgG-glul9-29

 <400> 13
 gagaattcat ttaaagatt ctgctgggtg tcctgatg 38

 <210> 14
 <211> 40
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer used for constructing a vector

pCAGGS-IFN-rR-IgG-glu19-29

<400> 14
gcagcatcgc ggccgcttct tctctgtcat catggagaaa 40

<210> 15
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer used for constructing a vector
pCAGGS-CTLA4-IgG-glu19-29

<400> 15
gagaattcat ttaaattggct tgtcttggac tccagagg 38

<210> 16
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer used for constructing a vector
pCAGGS-CTLA4-IgG-glu19-29

<400> 16
gcagcatcgc ggccgcttct gaatctgggc atggttctgg 40

<210> 17
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer used for constructing a vector
pCAGGS-IL13-IgG-glu19-29

<400> 17
gagaattcat ttaaattggca ctctgggtga ctgcagtc 38

<210> 18
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide primer used for constructing a vector
pCAGGS-IL13-IgG-glu19-29

<400> 18
gcagcatcgc ggccgcttgg ccatagcgga aaagttgctt 40

<210> 19
 <211> 38
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer used for constructing a vector
 pCAGGS-IL1RA-IgG-glul9-29

 <400> 19
 gagaattcat ttaaattggaa atctgctggg gaccctac 38

 <210> 20
 <211> 40
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer used for constructing a vector
 pCAGGS-IL1RA-IgG-glul9-29

 <400> 20
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 <210> 21
 <211> 62
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer used for constructing a
 vector pCAGGS-glul9-29

 <400> 21
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 tg 62

 <210> 22
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer used for constructing a
 vector pCAGGS-glul9-29

 <400> 22
 gagagagaga attctcaggt attcatcaac cactgcacaa aatcttgggc 50

 <210> 23
 <211> 38
 <212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer used for constructing a
vector pCAGGS-IL8-glul9-29

<400> 23

gagaattcat ttaaagtact tccaagctgg ccgtggct

38

<210> 24

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer used for constructing a
vector pCAGGS-IL8-glul9-29

<400> 24

gcagcatcgc ggccgctgaa ttctcagccc tcttcaaaaa

40